

[Method and Apparatus for Microwave Assisted High Throughput High Pressure Chemical Synthesis]

Abstract

A method and associated instrument are disclosed for increasing the sequential rate at which a series of microwave assisted chemical reactions that potentially generate high pressure can be carried out. The method includes the steps of opening a pressure-resistant valve on a microwave-transparent pressure-resistant vessel to define a unpressurized pathway through the valve into the vessel, inserting a tube through the pathway in the valve and into the vessel, transferring at least one composition into the vessel through the tube, removing the tube from the vessel and from the pathway in the valve, closing the valve to seal the vessel against pressure release, and exposing the vessel and its contents to microwave radiation. The instrument includes a source of microwave radiation, a cavity in microwave communication with the source, an attenuator that forms at least a portion of the cavity, a pressure-resistant microwave-transparent reaction vessel having portions in the cavity and portions in the attenuator, a pressure-

resistant valve on the mouth of the vessel, a reciprocating tube for passing through the valve and into the vessel when the valve is open, and means for mechanically inserting and retracting the tube through the valve and into the vessel when the vessel is in the cavity and the attenuator.